

CLAIMS

1. A primary cultured adipocyte for gene therapy, wherein the adipocyte stably maintains a foreign gene encoding a protein that is secreted outside of a cell.
2. The adipocyte of claim 1, wherein the gene is transferred to the cell by a retroviral vector or adeno-associated viral vector.
3. The adipocyte of claim 1, which has the ability to significantly express the protein *in vivo* for at least 20 days.
4. The adipocyte of claim 1, which is used to release the protein into the blood flow.
5. The method of claim 1, wherein the protein is insulin or glucagon-like peptide 1 (GLP-1).
6. A method of producing an adipocyte for gene therapy, wherein the method comprises the steps of:
 - (1) primary culturing an adipocyte; and
 - (2) transferring, and then stably holding a foreign gene encoding a protein that is secreted outside of the cell.
7. The method of claim 6, wherein the foreign gene is transferred by a retroviral vector or adeno-associated viral vector.
8. An adipocyte for gene therapy, which is produced by the method of claim 6 or 7.
9. An implant composition for gene therapy, wherein the composition comprises a primary cultured adipocyte, which stably holds a foreign gene encoding a protein that is secreted outside of the cell, and a pharmaceutically acceptable carrier.
10. The implant composition of claim 9, which further comprises an

extracellular matrix component.

11. The implant composition of claim 9, which further comprises an angiogenesis factor.

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12. A gene therapy method comprising the step of administering a body with a primary cultured adipocyte, which stably holds a foreign gene encoding a desired therapeutic protein that is secreted outside of a cell.

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13. A method of releasing a protein into the blood flow, wherein the method comprises the step of administering a body with a primary cultured adipocyte that stably holds a foreign gene encoding a protein that is secreted outside of the cell.

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14. The method of claim 13, which is a method for releasing the protein into the blood flow for 20 days or more.

15. A method for lowering blood glucose, wherein the method comprises the step of administering a body with a primary cultured adipocyte, which stably holds a gene encoding insulin or glucagon-like peptide 1 (GLP-1).

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16. An animal, the body of which is implanted with a primary cultured adipocyte that stably holds a foreign gene that encodes a protein secreted outside of a cell.

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